**Project title**

Utilising local ecological knowledge for locating an elusive species. The Ecology of the Western European hedgehog (*Erinaceus europaeus*) in extensive farmland of mixed agricultural use in County Cork, Ireland.

**Researcher profile**

Early twenties female Irish researcher. At the time of the project I was just beginning my PhD project. My only previous research experience was through my fourth year project (a mammal survey in urban parks) and a short (four month) research project on visitor interactions with free ranging ring tailed lemurs (*Lemur catta*) at Fota Wildlife Park, Cork. This was my first experience of working directly with landowners and in a rural setting.

**Context**

In 2007, at the start of my PhD virtually no research had been completed on this species in Ireland. While this offered a wide scope in terms of possible research questions, it meant there was also not a lot of background knowledge to build on. One prominent Irish mammal ecologist even cautioned me that “hedgehogs are the Zoologists graveyard”, a point that lingered in my head on the many fruitless nights I spent searching for these elusive creatures with a spotlight, and my early mornings checking traps.

The fieldwork was conducted solely by one researcher, predominantly at night and involved interacting with landowners prior to commencement. It was concentrated in County Cork and was the sole project on the species at the time. It was a four year project, investigating all aspects of the hedgehog's ecology (habitat use, feeding, courtship, nesting and hibernation behaviour).

**Problems Encountered**

I based much of my initial methodology on previous research on hedgehogs in the U.K, Netherlands and Sweden, trialling detecting their presence using footprint tunnels and trapping using rabbit traps. Both methods proved unsuccessful with the footprint sheets often being obscured by non-target species, eaten by slugs and waterlogged. The traps proved equally unsuccessful and after several months I had neither caught nor detected hedgehogs. At this time, I visited England and Scotland to meet with previous hedgehog researchers who kindly shared the benefits of their knowledge. One thing was their shared experience of traps not working. One for instance, had trapped for 2084 trap nights which yielded just one successful capture. However, as there is such a culture of only publishing the success stories, this would never have been known to me without talking to researchers directly.

**Process/Method**

I spent many fruitless months trying to locate even one hedgehog, which when under the time constraint of a PhD was very stressful. To try and pinpoint a population, I started surveying golf courses, farms and members of the public. It was through this that I got to talk directly with people who were working directly on the land and hearing their experiences. All too often in research, we become almost immune to people having an opinion or suggestion when they hear what we are studying. Occasionally, we can also be guilty of almost having an elitist attitude that we are scientists and therefore must know more. However, we are often only capturing a snippet of time, where others could be working directly with the habitat for decades. In the case of my project, talking to landowners and taking on board their experiences was to prove invaluable.

Several green keepers talked about regularly coming across sick and listless hedgehogs, something that could have proved an interesting line of research in itself. Meanwhile, I spoke to several farmers who talked about regularly coming across hedgehogs on arable land. This surprised me as from the literature arable fields represented the lowest rank of habitat preference. This may not be surprising, as earthworms, which are reported as an important prey item for hedgehogs, generally occur at a lower density in arable land than pasture and in the U.K hedgerow also persists least well in districts where arable farming prevails. However, based on this hunch, I started to search areas dedicated to this land use and in particular to explore their use in relation to hedgerow density and corresponding prey availability.

I radio tracked a population of hedgehogs for three years in a heterogeneous landscape consisting of gardens, scrub, woodland and extensive arable and pasture. Compositional analysis of the data showed that habitats were not used in proportion to their availability. Annually hedgehogs concentrate their activity in pasture during the breeding season (April-July) and arable land in September and October. Arable land was the most preferred habitat in September and October, in successive years, and the second most preferred habitat overall. The increase in hedgehog activity in arable land corresponded with a rise in surface invertebrates in this habitat, and to an increase in the amount of time hedgehogs spent foraging. Transects surveying surface invertebrates were sampled in the centre and hedgerow of several arable fields. Contrary to other research, in the majority of the hedgehogs’ home range, individuals consistently foraged in the centre of both pasture and arable land. Potential prey was lower in fields where the hedgerow had no bramble understory, and this suggests that hedgerows with good ground cover act as important reserves for invertebrates. This is something which could have accounted for the usual low numbers of hedgehogs reported in arable land elsewhere. This research made up two of the main chapters of my thesis and evolved solely from my initial conversations with farmers.

**Costs and impacts**

I wasted a lot of time at the start of the project trialling methods that proved unsuccessful and discounting habitats that I felt, through the literature, were not worth surveying. Thankfully, I spoke to previous researchers and landowners within my first year, which prevented the loss of a valuable field season. I also explored other lines of research such as the collection of roadkill which successfully broadened the scope of the project. If I had ignored this anecdotal evidence or explored it too late, I would have missed a valuable insight into the factors impacting on hedgehogs and their prey's habitat use. Worst, I would have run the risk of never locating a population and being forced to concentrate solely on the road kill data.

**Lessons for practitioners**

As a result of this experience, when I started my next project, a post-doc on red squirrels (*Sciurus vulgaris*) on Fota Island, Cork, I was eager to talk to those working on site from the onset of the project. This I feel saved a lot of time and problems. The green keepers at the golf course went out of their way to take the time to show me where they had seen squirrels and drive me around the site. This proved invaluable in deciding where to concentrate trapping effort. In addition, the keepers at the Wildlife Park gave me unique insights into the squirrels foraging behaviour. These findings formed the basis for one of the primary papers from this research and again emphasised the importance of never underestimating local knowledge and those working directly on the ground. Afterall, in many cases these are the people who we require to implement the changes we deem necessary through our research, and this can only be achieved through cooperation and understanding.

It is fair to say that the anecdotal evidence that I acquired through my interactions with landowners and those working directly at the site provided just as much relevant groundwork for my projects as what I obtained through published research. However, due to the inability to adequately reference, and the reluctance of many reviewers to accept personal experience over citing scientific publications, the importance of these early conversations is largely lost and not apparent to anyone reading my papers or thesis. Therefore, a crucial element is also missing, which could lead future researchers to make similar mistakes or become deaf to these unique anecdotal experiences.